<u>Amendment to the Claims</u>:

1. (Currently Amended) An X-ray imaging method comprising the following steps:

forming a set of a plurality of two-dimensional X-Ray projection images of a medical or veterinary object to be examined through a scanning rotation by an X-Ray source<u> and two-dimensional detector</u>, which X-Ray images are acquired at respective predetermined time instants with respect to a functionality process produced by said object;

separating an estimated motion of parts of said object into a non-linear temporal component caused by overall contraction within said object, and a linear temporal component caused by overall rotation within said object;[[,]]

reconstructing by back-projection a <u>motion artifacted</u> three-dimensional volume image of said object from the set of two-dimensional X-Ray projection images;[[,]]

deriving <u>a</u> ~~an appropriate~~ motion correction for the respective two-dimensional images as based on a motion vector field;[[,]]

<u>applying the motion correction to the set of two-dimensional X-ray projection images, generating a set of corrected two-dimensional X-ray projection images;</u>

~~and subsequently~~ from the ~~various~~ <u>set of</u> corrected two-dimensional <u>X-ray projection</u> images, reconstructing <u>a motion corrected</u> ~~the intended~~ three-dimensional volume;

wherein said motion correction is derived from reference images that are acquired in corresponding instants of the movement of the object in question that is substantially periodic, and which reference images have substantially differing projection orientations.

2. (Cancelled)

3. (Currently Amended) The method as claimed in Claim <u>1</u> ~~2~~, wherein said corresponding instants ~~refer to~~ <u>of the movement include</u> corresponding phases of a cardiac movement.

4. (Previously Presented) The method as claimed in Claim 3, wherein said movement is derived from following one or more feature points of the object.

5. (Currently Amended) The method as claimed in Claim 1, further including: ~~based on feature extraction for~~

deriving said motion vector field base on feature extraction.

6. (Previously Presented) The method as claimed in Claim 1, wherein two-dimensional projections are corrected towards a calculated shape by the functionality process of said object.

7. (Cancelled)

8. (Previously Presented) The method as claimed in Claim 1, applied to coronary arteries.

9. (Currently Amended) The method as claimed in Claim 1 ~~2~~, wherein said projection orientations differ by an angle in a range between substantially 45 degrees and 90 degrees.

10. (Currently Amended) The method as claimed in Claim 1, ~~further comprising~~ wherein the object includes a coronary artery with a stent in place and an artery wall section of said artery ~~being under investigation~~.

11. (Previously Presented) The method as claimed in Claim 1, further comprising deriving said motion correction from physical elements present in the object.

12. (Currently Amended) The method as claimed in Claim 1, ~~further comprising including in~~ wherein said correction includes ~~an overall~~ translation of ~~pertaining to~~ said object.

13. (Previously Presented) The method as claimed in Claim 1, further comprising deriving an amount of movement correction from a measured distance between an identified two-dimensional marker/feature position and a reference two-dimensional marker/feature position, or through an ECG analysis

14. (Currently Amended) The method as claimed in Claim 1, further comprising: ~~using built-in cardiac motion compensation for three-dimensional cardiac ROI reconstruction, and~~

generating and overlaying multiple projection images ~~runs~~ of a cardiac region whilst maintaining one or more markers at the same position, and ~~by overlaying~~ making the multiple cardiac ROI reconstructions by overlaying the projection images.

15. (Previously Presented) The method as claimed in Claim 1, further comprising generating a four-dimensional data set.

16. (Currently Amended) The method as claimed in Claim 1, further comprising:

determining [[a]] temporal gating ~~as being~~ based on [[a]] three-dimensionally resolving [[of]] a feature point location.

17. (Currently Amended) ~~The~~ A method ~~as claimed in Claim 1, further~~ comprising ~~one or more steps of the following sequence of steps~~:

- Acquiring a rotational angiography data set ~~from a calibrated system~~ including a plurality of projections at each of a plurality of viewing angles;
- Reconstructing a low-spatial-resolution volume data set ~~for~~ from a portion of the projections which correspond to a ~~specific heart~~ selected cardiac phase;
- Estimating a three-dimensional centerline in the volume data;
- Forward projecting at least one of the volume data [[or]] and the three-dimensional centerline into the ~~successively acquired~~ projections ~~with different projection geometry~~ of the angiography data set;
- Using the forward projected volumes or the centerlines as [[an]] initial approximations for ~~the~~ correct motion-compensation[[ed]] of the projection ~~for this~~ at each viewing angle;

- Calculating a transformation matrix between the initial approximation and the ~~real acquired~~ projection at ~~the current~~ each viewing angle;
- Transforming the ~~acquired~~ projection at each viewing angle with the corresponding transform matrix to transform the projection into the selected ~~correct~~ cardiac phase ;
- ~~Incorporating the additionally acquired projections in the three-dimensional reconstruction procedure by the successive application of the above on any or all appropriate projections~~ Reconstructing the transformed projections into a three-dimensional projection image.

18. (Currently Amended) An X-Ray apparatus comprising:

an X-Ray facility for forming a set of a plurality of two-dimensional X-Ray projection images of an object to be examined through a scanning rotation by an X-Ray source ~~vis-à-vis said object~~, which X-Ray projection images are acquired ~~at respective predetermined time instants~~ as the object undergoes substantially periodic motion, and which X-ray projection images each have one of a plurality of projection orientations ~~with respect to a functionality process produced by said object~~;

a data processor which reconstructs ~~processing means fed by said X-Ray facility for reconstructing~~ by back-projection a selected phase three-dimensional volume image of said object from ~~the set~~ a subset of X-Ray projection images which were acquired in a selected phase of the periodic motion,

forward projects the selected phase three-dimensional volume image into each of the projection orientations,

derives a motion correction for each of the projection orientations based on the acquired projection image and the forward projection image corresponding to each projection orientations,

corrects the acquired projection images with the corresponding derived motion correction, and

reconstructs the motion corrected acquired images into a motion corrected three-dimensional volume image

~~and correcting means interacting with said data processing means for by deriving an appropriate motion correction for the respective two-dimensional images as based on a motion vector field, and for subsequently feeding the various~~

~~corrected two-dimensional images to said data processing means for reconstructing the intended three-dimensional volume~~.

19. (New) The method as set forth in claim 1, further including:

creating a transformation matrix that transforms the three-dimensional volume image from one phase into another.